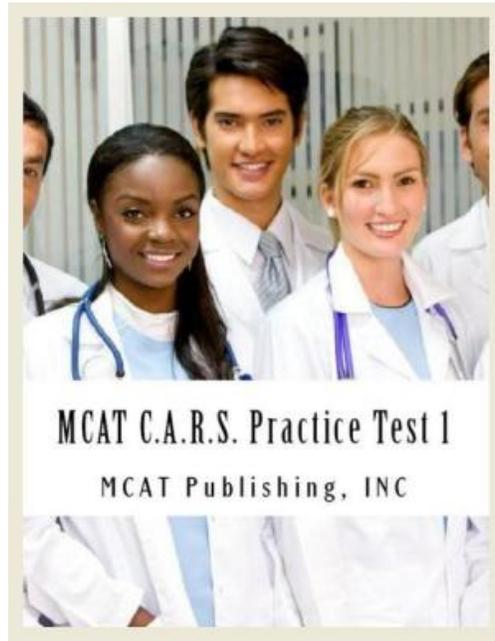


MCAT C.A.R.S. Sample Critical Analysis and Reasoning Skills



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Critical Analysis and Reasoning Skills (C.A.R.S.)

This section assesses student achievement and ability in the Critical Analysis and Reasoning Skills (C.A.R.S.) section of the MCAT, including Deductive Reasoning and Logic.

Possible topics and skills in this section include:

Logical Operators	Presuppositions
Variables	Denials
Declaratives	Equivalencies
Propositions	Disambiguation
Conjunctions	Certainty
Disjunctions	Pathology
Exclusives	Etymology
Implications	Classic Flaws
Biconditionals	Assumptions
Negations	Incorporations
Contrapositives	Applications

Noticeable in Japanese haiku, kireji, or cutting words, typically appear at the end of one of the verse's three phrases. A kireji fills a role somewhat analogous to a caesura in classical western poetry or to a volta in sonnets. Depending on which cutting word is chosen, and its position within the verse, it may briefly cut the stream of thought, suggesting a parallel between the preceding and following phrases, or it may provide a dignified ending, finishing the verse with a heightened sense of closure.

The fundamental aesthetic quality of both hokku and haiku is that it is internally sufficient, independent of context, and will bear consideration as a complete theme. The kireji lends the verse structural support, allowing it to stand as an independent poem. The use of kireji distinguishes haiku and hokku from second and subsequent verses of renku which, although they may employ semantic and syntactic disjuncture, even to the point of occasionally end-stopping a phrase with a shōjoshi (sentence-ending indicator), do not generally employ kireji.

In English, since kireji have no direct equivalent, poets sometimes use punctuation such as a dash or ellipsis or an implied break to create a juxtaposition intended to prompt the reader to reflect on the relationship between two parts.

The earliest westerner known to have written haiku was the Dutchman Hendrik Doeff, who was the Dutch commissioner in the Dejima trading post in Nagasaki during the first years of the 19th century. One of his most famous haiku is about travelers.

lend me your arms
fast as thunderbolts -
for a pillow on my journey

In France, haiku was introduced by Paul-Louis Couchoud around 1906. Couchoud's articles were read and well-received by early imagist theoretician F. S. Flint, who passed on Couchoud's somewhat idiosyncratic and unfamiliar ideas to Ezra Pound and other members of the Proto-Imagist Poets' Club. Building on the French success, Amy Lowell made a trip to London to meet Pound and prospect haiku for the American audience.

1. If the passage were to continue, the next paragraph would most likely address which of the following topics?
 - A. the first American experience with haiku
 - B. the first British experience with haiku
 - C. the first female experience with haiku
 - D. the reasons why Couchoud's work was not well-received in Japan

 2. Hokku are the opening verses of multi-verse renku poems. According to the passage, what is the biggest difference between hokku and haiku?
 - A. Hokku can exist as an independent poem.
 - B. Haiku can exist as an independent poem.
 - C. Hokku uses kireji.
 - D. Haiku uses shōjoshi.

 3. Most analogous to the Japanese kireji is ...
 - A. the Russian "Myakhiy Znak" or Soft Sound Symbol
 - B. the Greek letter "Rho" written as "P"
 - C. the Mandarin word "Yóuyú" which can mean "because" or "squid" depending on the usage
 - D. the "Ackee Sapindaceae", a fruit that does not grow outside of Tropical West Africa
-

Jellyfish may sting, and porcupines may puncture, but there is a species of termite that is much more committed to defense. *Neocapritermes taracua*, found in the rainforests of French Guiana, take altruism seriously: aged workers grow sacks of toxic blue liquid that explode on command in an act of suicidal self-sacrifice to help colonies survive.

The “explosive backpacks”, described in *Science* today, grow throughout the lifetimes of the worker termites, filling with blue crystals secreted by a pair of glands on the insects' abdomens. Older workers carry the largest and most toxic backpacks. Those individuals also, not coincidentally, are the least able to forage and tend for the colony: their mandibles become dull and worn as the termites age, because they cannot be sharpened by molting as is done by other arthropods. “Older individuals are not as effective at foraging and nest maintenance as younger workers,” says Robert Hanus, who studies termite biology at the Institute of Organic Chemistry and Biochemistry.

But when the workers are attacked, he says, “they can provide another service to the colony. It makes perfect sense; theories predict that social insects should perform low-risk, hard tasks such as housekeeping (only) in the first part of their life.”

Self-destructive behavior is common among the sterile worker castes of eusocial insects such as termites and honeybees. The workers forego reproduction, so they are free to evolve altruistic behaviors that benefit the colony as a whole rather than themselves as individuals. Defensive suicidal rupturing — termed Autothysis — has evolved independently in a number of termite species. The behavior must be highly adaptive.

Neocapritermes taracua use a chemical reaction to make its defense even more toxic. The pouches holding the copper-containing blue crystals are located near to the salivary glands. When the termites are attacked, the crystals mix with salivary secretions, producing the toxic blue liquid. “It is the two-component chemistry that underlies the exceptional toxicity in this species,” says Hanus. The blue liquid from older workers is the most toxic. “The sophistication of this is remarkable: we have never seen an external pouch like this before. This is the power of eusociality, why these insects are successful.”

4. By inference from the passage, which of the following could be considered analogous to eusocial behavior like that of termites and bees?
- A. Damaraland mole rats react to harsh conditions by producing both diploid and haploid offspring.
 - B. Whales travel in pairs or small groups when travelling large distances.
 - C. Piranha eat each other when food is scarce.
 - D. Large female kangaroos often protect joeys from several smaller mothers when a lion gets too close.
5. According to the author's hypothesis, how have different species of termites independently evolved to develop the poisonous "explosive backpacks"?
- A. The termites' common ancestor had well-defined poison sacs.
 - B. The termites' predators have learned to eat only the non-lethal termites.
 - C. The termites develop the sacs in response to predator behavior.
 - D. All termites have poison sacs; only certain species use them for defense.
-

Sample Passage Map

Noticeable in Japanese **haiku**, **kireji**, or **cutting words**, typically appear at the end of one of the verse's three phrases. A kireji fills a role somewhat analogous to a caesura in classical western poetry or to a volta in sonnets. Depending on which cutting word is chosen, and its position within the verse, it may briefly cut the stream of thought, suggesting a parallel between the preceding and following phrases, or it may **provide** a dignified **ending**, finishing the verse with a heightened sense of closure.

The **fundamental aesthetic** quality of **both hokku** and **haiku** is that it is internally sufficient, independent of context, and will bear consideration as a **complete theme**. The kireji lends the verse structural support, allowing it to stand as an independent poem. The use of kireji distinguishes haiku and hokku from second and subsequent verses of renku which, although they may employ semantic and syntactic disjuncture, even to the point of occasionally end-stopping a phrase with a shōjoshi (sentence-ending indicator), do not generally employ kireji.

In **English**, since **kireji** have **no direct equivalent**, poets sometimes use punctuation such as a dash or ellipsis or an implied break to create a juxtaposition intended to prompt the reader to reflect on the relationship between two parts.

The **earliest westerner** known to have written haiku was the **Dutchman** Hendrik **Doeff**, who was the Dutch commissioner in the Dejima trading post in Nagasaki during the first years of the 19th century. One of his most famous haiku is about travelers.

lend me your arms
fast as thunderbolts -
for a pillow on my journey

In **France**, haiku was introduced by Paul-Louis **Couchoud** around 1906. Couchoud's articles were read by early imagist theoretician F. S. Flint, who passed on Couchoud's somewhat idiosyncratic ideas to Ezra Pound and other members of the proto-imagist Poets' Club. Amy **Lowell** made a trip to **London** to meet **Pound** and prospect haiku for the **American** audience.

Sample Passage Summary

What an expert map should tell you:

Paragraph 1 -

Haiku contain something called Kireji "cutting words".

They provide certain functions in poems.

Paragraph 2 -

There is a fundamental structure to kireji and something called hokku.

Paragraph 3 -

Kireji have no English equivalent.

Paragraph 4 -

Doeff from Holland was the first westerner.

Haiku Indent -

Nothing here to highlight. This can be found quickly if need be.

Paragraph 5 -

Couchoud brought haiku to France.

Lowell went to London to chat with Pound about haiku in America.

Expert Explanations:

1.

B. the first British experience with haiku
Very tricky question! (A) Looks good as a next topic, but we would need to explore the British experience before bringing haiku to America and discussing that reaction. The MCAT pays careful attention to the order of descriptions!
A. the first American experience with haiku.
Incorrect, because we must discuss the British reaction first.

C. the first female experience with haiku.
Incorrect, because Lowell might not have been the first female.

D. the reasons why Couchoud's work was not well-received in Japan.
Incorrect, because this was never introduced.
 2.

B. Haiku can exist as an independent poem.
Look to the question itself for help with the answer. Hokku is the start of a poem. Yes, it has internal completeness of theme, but only the haiku can exist alone as a complete poem. At least, that's all the passage offers.

A. Hokku can exist as an independent poem. = Inconsistent with question
Incorrect, because that is inconsistent with the question.

C. Hokku uses kireji.
Incorrect, that is not a difference, just a true statement.

D. Haiku uses shōjoshi.
Incorrect, because this was not addressed in the passage.
 3.

A. the Russian "Myakhiy Znak" or Soft Sound Symbol.
Kireji is an indicator of how to understand Japanese written language, and it has no English equivalent. This is exactly like the Soft Sound Symbol, which helps pronunciation and comprehension of Russian language.

B. the Greek letter "Rho" written as "P"
Incorrect, because it's merely counter-intuitive pronunciation.

C. the Mandarin word "Yóuyú" which can mean "because" or "squid" depending on the usage
Incorrect, because it's not analogous to a vehicle for proper grammar.

D. the "Ackee Sapindaceae", a fruit that does not grow outside of Tropical West Africa
Incorrect, because the English language could still have a name for it even though it's not in America. We have a name for the Amazon River, right? That's mostly in Brazil and Peru.
-

4. *A. Damaraland mole rats react to harsh conditions by producing both diploid and haploid offspring.*

Eusocial Behavior includes cooperative brood care, overlapping generations within a colony of adults, and a division of labor into reproductive and non-reproductive groups. Paragraph 4 includes "workers forego reproduction" which hints at (A) being the surprisingly correct answer.

- B. Whales travel in pairs or small groups when travelling large distances.*

Incorrect, because it's not an example of selflessness.

- C. Piranha eat each other when food is scarce*

Incorrect, because it's the opposite of eusocial behavior.

- D. Large female kangaroos often protect joeys from several smaller mothers when a lion gets too close.*

Incorrect, because it's illogical. Protect joeys from other kangaroos?

That doesn't make any sense at all. Imprecise reading will cause a lot of anxious students to make this mistake.*

5. *C. The termites develop the sacs in response to predator behavior.*

Paragraph 4 states: "suggesting that the behavior is highly adaptive"

This hints at a common defense mechanism that separate species might have in response to a threat.

- A. The termites' common ancestor had well-defined poison sacs.*

Incorrect, because there was no discussion of a common ancestor.

- B. The termites' predators have learned to eat only the non-lethal termites.*

Incorrect, because this was neither stated nor implied.

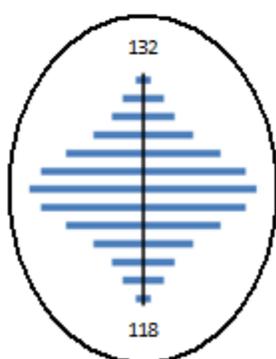
- D. All termites have poison sacs; only certain species use them for defense.*

Incorrect, because this was never addressed, nor is it true.

* Choice (D) should be reviewed very carefully at all time, because the AAMC knows that a lot of test-takers use Process of Elimination. If a student carelessly discards a correct answer and keeps reading other answer choices, there's a chance they'll eliminate (A), (B), and (C) and then choose (D) without even reading it. That's a terrible idea, but it happens. For that reason, the AAMC has some pretty whacky (D) answers sometimes :) Don't get caught by this trap. Read carefully!

Scale for a full 53-Question CARS Section

Raw Score <small>Number of Correct Answers</small>	Scaled Score <small>MCAT C.A.R.S. Result</small>	Percentile Rank <small>Assessed by National Average</small>
51 - 53	132	99.99%
50	131	99.1%
48 - 49	130	97.6%
46 - 47	129	94.3%
43 - 45	128	88.2%
39 - 42	127	82.7%
36 - 38	126	71.7%
33 - 35	125	50.0%
29 - 32	124	45.2%
26 - 28	123	34.8%
22 - 25	122	23.1%
19 - 21	121	15.5%
16 - 18	120	10.8%
10 - 15	119	5.3%
0 - 9	118	0.0%



MCAT Result
Score Distribution

Big Picture Takeaways:

You can skip 2 questions and still get a **perfect score**.

... so don't obsess over one question.

You can skip an entire passage and still **beat 97.6%** of test takers.

... so don't obsess over a tough passage.

Today is not Test Day; there's time to improve.

Practice doesn't make perfect, it makes data.

You can use that data to learn from your mistakes.

Track your progress, conquer the MCAT, and achieve your goals!

MCAT C.A.R.S. Fallacy Guide *(additional pages in the full CARS book)*

A logical fallacy is an error in reasoning that renders an argument invalid.

Arguments are logical conclusions reached through sound or unsound reasoning.

When an argument is unsound, it can be labeled *fallacious*.

The MCAT is your friend, but wrong answers are the enemy!

Memorizing this list of fallacies will help you spot them on test day.

Attack (*Ad Hominem*) The author is flawed so the argument must be.

"James thinks the Yankees will win this year, but he's an art major so what does he know?"

Untested (*Ad Ignorantum*) The argument is true just because it has not been proven false.

"I think a chocolate-only diet must be very healthy, because no study has declared that untrue."

Bandwagon (*Ad Populum*) The argument is true because it's popular.

"Everyone loves the music of Selena Gomez, so it must be great music."

False Authority (*Ipse Dixit*) The argument is true because someone famous or powerful supports it.

"Russell Crowe believes in UFOs, so they must exist."

Hasty Generalization (*Secundum Quid et Simpliciter*) The argument relies on too small a sample.

"Apples and oranges are spherical, so all fruit must be spherical."

Sweeping Generalization (*Dicto Simpliciter*) The argument applies a generalization to all members.

"Most firefighters are male, so no firefighter would ever need maternity leave."

Slippery Slope (*Reductio ad Absurdum*) The argument jumps to an illogical and extreme conclusion.

"If you eat raw celery, soon you'll be eating things like tree bark and then wooden shoes."

Probability (*Ad probabilitum*) The argument assumes something that could happen must happen.

"It's likely that Joe will pass his USMLE soon, so we should purchase the vacation cruise tickets ASAP."

Straw Man (*Ad Logicam*) The argument relies on a misrepresentation, usually pushed to an extreme.

"Dan said New Yorkers are funny but not everyone from the East Coast is funny so Dan is wrong."

"You say you're against vaccinations, but do you really think all medicine is futile?"

"So, you think I'm not a true environmentalist because I don't make my own clothes?"

MCAT Formal Logic Tips

#1. Formal Logic is about Confidence.

Differentiate between things that are 100% certain and things that might possibly be true.

#2. Formal Logic is about Math.

Turn sentences into math to make them more straightforward.

e.g. None of the puppies at the show were hungry at that time, because they just ate.

Puppy \neq Hungry

P \neq H

#3. Formal Logic is about Causation.

Convert complicated sentences into simple Trigger \rightarrow Result formats.

e.g. Because Jane saw the dining room lights go out during dinner, she knew that there would be a birthday cake with lit candles coming out of the kitchen.

"If lights go out (L), then birthday cake is coming (B)."

L \rightarrow B

Additional Examples:

If Ross eats an apple, then he will also eat some grapes.

A \rightarrow G (contrapositive) **\neq G \rightarrow \neq A**

If Rachel goes to the museum today, then she will not go to the zoo.

M \rightarrow \neq Z (contrapositive) **Z \rightarrow \neq M**

If Joey doesn't buy a Porsche, then he will buy a boat.

\neq P \rightarrow B (contrapositive) **\neq B \rightarrow P**

If Chandler doesn't upset Joey, then Chandler will not sit in a box.

\neq U \rightarrow \neq S (contrapositive) **S \rightarrow U**

(For more practice with contrapositives, please refer to the full CARS book.)

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